Case Report

Bilateral Sacroiliac Joint Dislocation Treated by Posterior Instrumentation Case Report and Literature Review

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Abstract

Sacroiliac joint dislocation is an uncommon and potentially life-threatening injury secondary to high-energy trauma. Given that bilateral sacroiliac joint dislocation has rarely been reported, its management constitutes a clinical challenge. The aim of this study was to review the literature available about sacroiliac joint dislocation management and to show an effective and reliable method to treat this kind of injury. Case report. We present a 15-year-old female patient who suffered a complete bilateral sacroiliac joint dislocation. The definitive treatment consisted of bilateral L4-iliac assembly plus right sacroiliac screw assisted by an O-arm navigation system. Surgical instrumentation allowed mobilization and full-weight-bearing a few days after surgery. At the 2-year follow-up, the patient remained asymptomatic. The triangle fixation technique stabilizes the sacroiliac joint and binds the lumbar spine to the pelvis. This method could represent a good option that allows early mobilization and weight-bearing.

Keywords: Iliac posterior instrumentation, O-arm navigation, sacroiliac joint dislocation, unstable pelvic fractures

Introduction

Bilateral sacroiliac joint dislocation is a very unusual and potentially life-threatening injury secondary to high-energy trauma. Given its low incidence and the limited number of cases reported,[1-3] guidelines are not available to treat this condition. It has been hypothesized that the mechanism of injury involves posterior-anterior compression force[4-7] with the lower extremities in a hyperflexed position.[8]

This injury corresponds to 61C3.1 according to the AO Classification. Although this lesion constitutes a lost connection between the axial skeleton and pelvis, the term spondylo-pelvic dissociation is not exact and should be reserved for transverse sacral fractures (U, H, or Y types).[9,10]

Case Report

The patient was a 15-year-old woman involved in a motor vehicle accident. She exhibited signs of peripheral hypoperfusion, including being cold, pale, and clammy (Glasgow Coma Scale 12/15). Vital signs were: Blood pressure, 90/50 mmHg; heart rate, 120 bpm; respiratory rate, 16 bpm; and O2 Sat, 99%. She complained of back and left lower-extremity pain. Hematuria was not observed in the Foley catheter. She exhibited mild lower abdominal stiffness and pain on palpation, ecchymosis in the posterior right thigh and mild internal rotation of her left lower extremity. She was able to mobilize both lower extremities with pain. A blood test revealed the following: Hb, 7.5 g/dL; Ht, 20.7%; and platelets, 100,000. Values compatible with consumption coagulopathy were noted.

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Body-Tc under superficial sedation revealed bilateral total sacroiliac joint dislocation with the sacrum and lumbar spine inside the pelvic cavity and nondisplaced fractures, including L5 transverse process, left superior and inferior pubic ramus with minimal symphysis diastasis and left anterior acetabulum [Figure 1].

Given the hemodynamic instability of the patient, urgent reduction was necessary. The reduction maneuver was performed using an X-ray scope and general anesthesia, and 6 kg bilateral femoral supracondylar traction plus upper-extremity contra-traction on both underarms was employed. A roll of sheets was placed under the lumbar spine to achieve lordosis. Given the persistent articular instability confirmed by X-ray, the patient was flipped into a prone position, and traction was maintained for the operation. The surgery involved a posterior right L5, S1, and iliac plus left L5 and iliac arthrodesis [Figure 2]. A total of 1 g of synthetic fibrinogen, 6 units of red blood cells, 2 units of platelets, and 4 fresh-frozen plasma units were required during surgery.

Postsurgical X-ray [Figure 2] revealed mild left sacroiliac joint subluxation. Hemodynamic stability and the patient's overall status improved, allowing the surgery to be performed on day 7. Thus, posterior instrumentation was extended, and a new bilateral L4-iliac assembly and a right sacroiliac screw were placed using an O-arm navigation system [Figure 3].

Pubic symphysis diastasis was also treated surgically: Open reduction and internal fixation by plate and cortical screws [Figure 4] were achieved through an anterior Pfannenstiel approach. Three days after the last surgery, the patient was discharged from intensive care. Bowel and bladder sphincter control were intact. Neurological exploration of the lower extremities was also completely normal. The patient started physical therapy and deambulation 7 days later (day 23). The patient was discharged on day 36 after admission with full-weight-bearing ability. At the 2-year follow-up, the patient was completely asymptomatic. Clinical evaluation revealed the complete absence of pain, full-weight-bearing ability without limp, normal osteotendinous reflexes, and 5 points in the Medical Research Council manual testing scale for all the muscle groups. Neurological examination through dermatomes revealed no alteration, and sphincter control remained unaffected. Radiological findings were satisfactory [Figures 5 and 6].

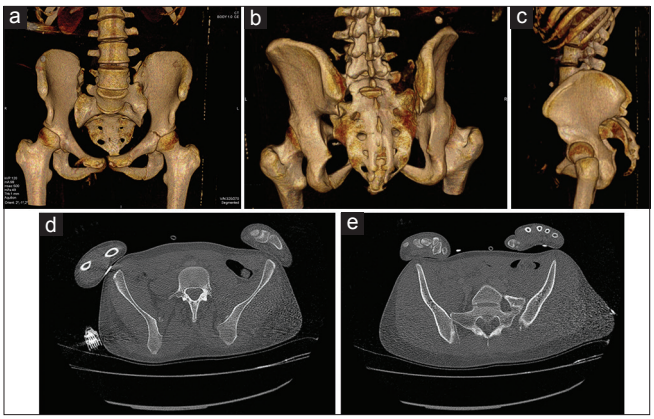

Figure 1: (a-e) Three-dimensional CT revealing total bilateral sacroiliac joint dislocation and fractures of the pubic ramus and acetabulum

Figure 3: X-ray after the second surgery

Discussion

Conservative treatment avoiding any type of reduction attempt,[2] reduction and bed rest with skeletal traction,[5] external fixation[11] and reduction plus internal fixation,[1,4,12-15] have

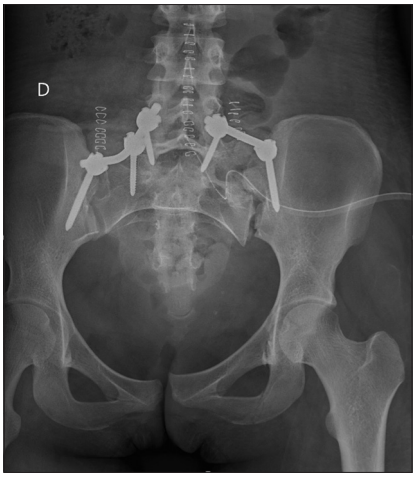

Figure 2: Postoperative X-ray revealing right sacroiliac joint reduction and persistent left sacroiliac subluxation

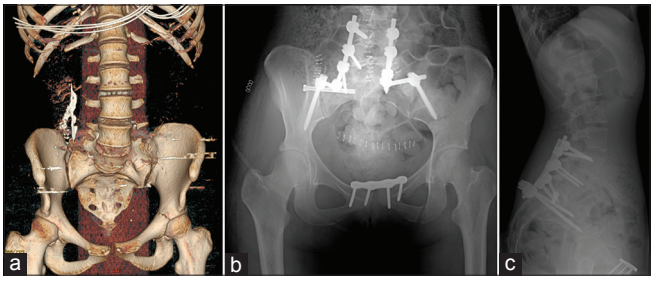

Figure 4: (a-c) X-ray after anterior pelvic ring fixation

Figure 5: X-ray at the 1 year follow up

been reported in the literature. The latter method is the method we applied in this case in an emergency manner because the patient exhibited hemodynamic instability with no other known bleeding focus. In addition, the acceptable reduction is difficult to achieve if treatment is delayed.[1,9,10]

The principal objective should be anatomic reduction and stable fixation to avoid posttraumatic pain, early osteoarthritis, or dysmetria. Early treatment also reduces morbidity and mortality.[16] Biomechanical studies in laboratory models have shown sacroiliac techniques (spinal instrumentation, iliosacral screw, and compression AO-plates) could be generally considered of equivalent stability value in an immediate postoperative period. Longer (>60 mm) iliac pedicle screws combined with bilaterally placed S1 screws may theoretically provide the best stability to the separated iliosacral joint, particularly if the disrupted symphysis is stabilized as well.[17,18] Other biomechanical studies report that the combination of the fixation procedures is recommended to allow early mobilization and weight-bearing.[19]

Some authors state that open reduction is needed to restore sacroiliac joint congruity. However, modern techniques allow closed anatomical reduction and percutaneous fixation with stable construction to reduce the second hit on these polytrauma patients.

The triangle fixation technique described in this article stabilizes the sacroiliac joint while binding the lumbar spine to the pelvis. This technique could serve as a good option that allows early mobilization and weight-bearing. Anterior pelvic ring osteosynthesis contributes to total pelvic stability.

Figure 6: X-ray at the 2 years follow up

Given the lack of consensus about implant removal for posterior spinal instrumentation,[20,21] pelvic osteosynthesis,[22,23] and the symphysis plate in women of childbearing age,[22] we advocate implant removal in cases of complication, material intolerance, or patient preference.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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